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A PUG-HEADED GRUNT, *HAEMULON PLUMIERI*

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The members of the family Haemulidae, or grunters, so named because of the characteristic noise each fish makes with its air bladder, are among the most numerous marine percoid fishes on our south Atlantic and Gulf coasts. These fishes are among the most abundant of the food fishes found in Florida and throughout the Gulf-Caribbean waters, and are common in collections, being caught everywhere. The American Museum has the specimen figured and described herein (No. 2904), along with other representatives.

This example seems to be unique in that it is the only pug-headed *Haemulon* of which there is any record. Large numbers of pug-headed fishes, chiefly from the fresh waters of Europe and America, have been described. These fresh-water pug-heads come mainly from two groups: the salmonids sought by anglers, and their monstrous forms contributed to museums by them; the other group includes the carps and the carp-like forms, which are caught in large numbers by commercial fishermen, and pug-headed specimens brought into markets are often sent to museums for identification. Thus was obtained the first pug-head ever figured and described by a scientific man.

Rondelet, one of the fathers of ichthyology, in a book on fishes published at Lugduni (Lyons, France) in 1555, figured and described such a pug-headed carp, which he says he purchased at the fish market in Lyons. Rondelet's account, buried in his old book, I found years ago, and when opportunity presented itself I reproduced his figure and gave an account of his find to make known to teratologists this earliest figure.[1]

Most of the marine pug-headed fishes reported belong to the sea-bass group. I have had and have described two such pug-heads[2] and in the same article I brought together accounts in the literature of such deformities in related fishes. To these records of salt-water pug-heads must now be added that of a *Haemulon*, a member of a group of marine fishes from which, so far as I know, no abnormality like this has ever been recorded. The history of this specimen follows.

[1]Gudger, E. W., 1928. 'Guillaume Rondelet's Pug-headed Carp: the Earliest Record,—A. D. 1554.' Nat. Hist., XXVIII, pp. 102–104, 2 text-figs.

[2]Gudger, E. W., 1930. 'Pug-headedness in the Striped Sea Bass, *Roccus lineatus*, and in Other Related Fishes.' Bull Amer. Mus. Nat. Hist., LXI, pp. 1–19, 3 Pls., 7 text-figs.

In the spring of 1910, the yacht 'Tekla' made a cruise in the waters of southern Florida. Mr. Alessandro Fabbri, the owner, invited Mr. John T. Nichols, of the department of fishes of the American Museum, for a cruise as a guest and particularly as a representative of the Museum. A number of interesting specimens were procured, but none more interesting than the one under consideration. At that time, there being no one at the Museum interested in such abnormalities, the fish was put away in storage and remained there until I began to publish articles on pug-headed fishes. Then our laboratory aid, Mr. Fred Kessler, remembered it and, to my great pleasure, brought it to my attention.

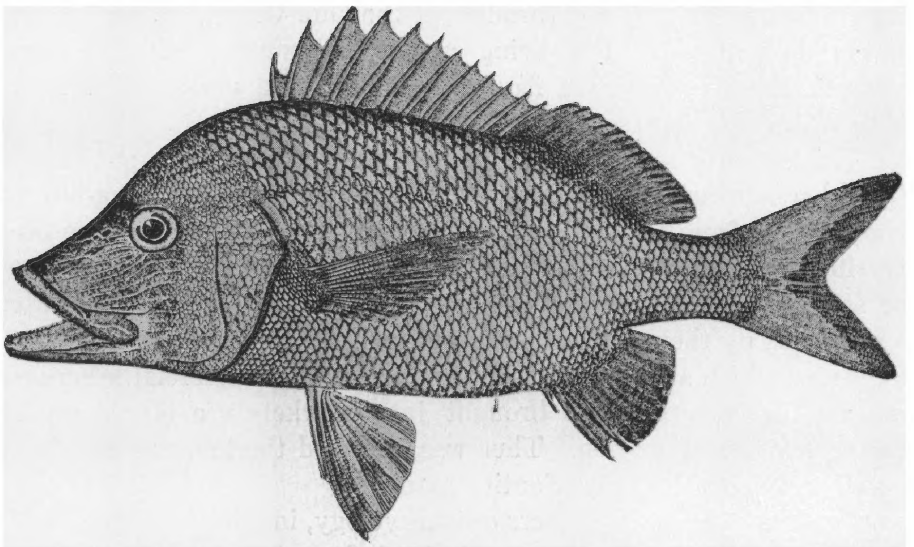

Fig. 1. Lateral view of a normal common grunt, *Haemulon plumieri*. The open mouth fails to give a correct idea of the steep forehead in the normal fish.
After Jordan and Evermann, 1900.

This specimen, which was taken in southern Florida in the spring of 1910, is a small fish only 218 mm. (6.8 in.) long over all, 75 mm. (3 in.) deep, and weighs 177 g. (6.25 oz.)—after being in preservative for nearly twenty-three years. It is, despite its small size, presumably mature. Examples of this species grow to a maximum size of eighteen inches and a weight of four pounds. However, specimens over two pounds are rare, and the average is said to be about one-third of a pound. The specimen under consideration is then of normal size and is adult.

It is a matter of interest to note that *Haemulon plumieri* ranges as far south as Brazil. Here was captured, figured, and described by George Marcgrave, that first great student of natural history in America,

a marine percoid fish which he called "Guabi coara Brasiliensibus" in his great book published in 1648.[1] This fish has been identified by the best authorities as the species of grunt under consideration. The present-day specific name was given to the fish by Lacépède, in 1802, by reason of a drawing of it sent to France from the island of Martinique by the Abbé Plumier.

The normal grunt, *Haemulon plumieri*, is a deep-bodied, short-nosed, steep-headed fish, in which the head is contained 2.5 to 2.8 in the body. These characters are very clearly shown in Figure 1, which is copied from the drawing reproduced in Jordan and Evermann's 'Fishes of North and Middle America' (1900, IV, Pl. ccv, fig. 532). Unfortunately the mouth is open and one cannot directly compare with it Figure 2, which is a drawing in lateral view of the pug-headed fish discussed in this paper. In the pug-head it is evident that the very marked shortening of the upper jaw has been accompanied with a very marked bulging of the forehead, directly in front of and on a level with the eyes. How great this bulging is may be seen by noting the distance from the nostrils forward to the rim of the forehead in Figures 1 and 2.

It has been difficult for me to divest myself of the idea that the lower jaw has also undergone shortening. However, the positions of the various structures of the head seem normal when compared with those in normal fish of the same species in our collection. Unfortunately our collection does not contain another specimen the exact size of the deformed fish, but comparative measurements lead to the conclusion that the lower jaw has undergone little if any shortening. This impression is strengthened when both fish are held in the position in which the deformed fish was held when Figure 3 was being drawn, and is further confirmed on opening the mouth and noting that in the abnormal fish the lower breathing valve is normally placed with regard to its distance from the point of the lower jaw.

Inspection of Figures 2 and 3 shows that the upper jaw is present in its entirety; in many pug-heads it is partly and frequently entirely lacking. Here it has been materially shortened, presumably in the central section, while the maxillary at the upper corner of the mouth seems entirely normal in shape and size. The flattened shape and crosswise position of the remnant of the upper jaw are admirably shown in Figure 3, where the head is looked at from above. Below, and in front of the head, the projecting lower jaw may be seen. The lower jaw

[1] 'Georgi Marcgravi Historiæ Rerum Naturalium Brasiliæ,' Amstelodami, 1648. (Guabi coara Brasiliensibus, p. 163, woodcut.)

projects 7 mm. beyond the cross-bar position of the upper. The projection in this view looks considerably greater than it does in Figure 1, but dividers show that both figures are accurately drawn. This cross-bar-shaped and -placed upper jaw is almost identical with what I found in the two specimens of *Roccus lineatus* described, as may be seen in Figure 4.

There is, then, in this specimen, a marked shortening of the head in the upper jaw region accompanied by a noticeable bulging in front of

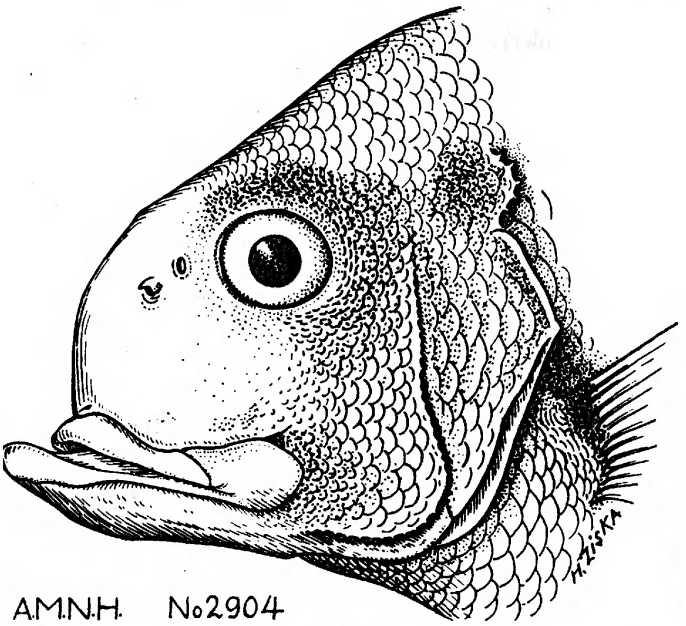

Fig. 2

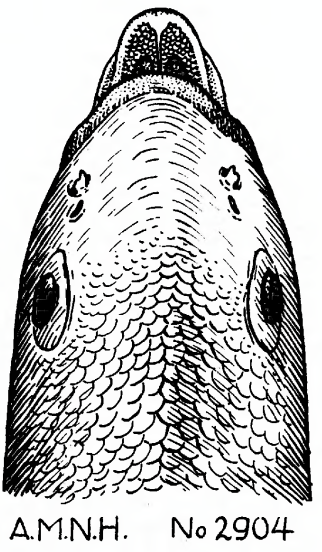

Fig. 3

Fig. 2. Lateral view of the head only of a pug-headed common grunt, *Haemulon plumieri*, from southern Florida.

Drawn from specimen No. 2904 in the American Museum.

Fig. 3. Dorsal view of the head of the abnormal grunt in the American Museum. Note the continuous upper and the projecting lower jaw.

eyes and nostrils. The front of the head has undergone a marked shortening in the center, at the point of union of the premaxillaries. This shortening of the premaxillaries has brought about a crowding of the teeth into two roundish pads which hang, as it were, from a bulge or shelf in the upper mouth. The distance from the point of the upper jaw to the hinder or free edge of the upper breathing valve is less than in the normal fish. Apparently, however, the shortening of the head has carried the breathing valve backward somewhat.

Pug-headedness in *Haemulon plumieri*, as in similar teratological specimens of fishes, is due to the failure of the parasphenoid, or basal bone of the skull, to elongate. In many specimens, as in the sea-bass previously referred to, the parasphenoid buckles up into the space between the eyes and causes a marked exophthalmia. Whether or not such a bulging of the eyes was visible in this specimen when fresh cannot be said, but in this fish, preserved for so long a time, the eyes are sunken, and I judge that they were never very prominent. It seems probable that in this fish the buckling of the parasphenoid (if such is present) has resulted in crowding the nasals, preorbitals, and ethmoids forward to produce the markedly outstanding forehead. How this buckling may produce bulging of the eyes may be seen in the eyes of the pug-headed sea-bass shown in Figure 4.

What causes the parasphenoid to behave in this fashion in fishes cannot definitely be said, but it is known that pituitary disturbances in mammals produce shortening of the head and face—and give rise to pug-headedness in dogs. No experimental work has been done on fishes, but at least one pug-headed trout embryo has been described; and, since all fish embryos are at first short-snouted, it would seem that pug-headedness in fishes may arise as a germinal defect. There is here an interesting if difficult field for investigation.

Neither in Dean's 'Bibliography of Fishes,' nor in the classified card catalogue continuing it since 1914, is their any reference to this type of deformity in this group of marine percoid fishes. It has been de-

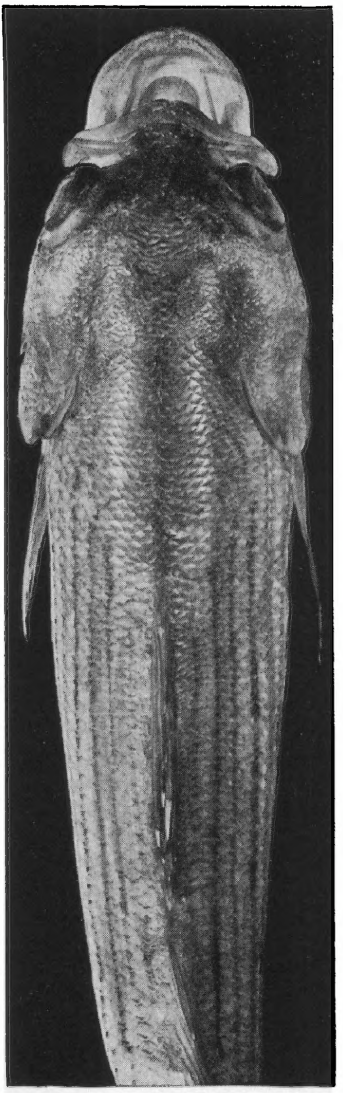

Fig. 4. Dorsal view of the anterior body-parts of a pug-headed sea-bass, *Roccus lineatus*. Here the same conditions found in the head of the grunt shown in Figure 3 may be seen, save that the eyes are protruding.

After Gudger, 1930.

scribed, however, in specimens of the related genera *Labrax* and *Roccus*, as noted above, and Mr. John T. Nichols, my colleague, tells me that he once saw a round-headed silver perch, *Bairdiella chrysura*, taken in Florida. This specimen is at present preserved in the collections of the Museum, and I purpose to describe it shortly.